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DRUG ADDICTION

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Widespread public concern exists over our current epidemic of cocaine abuse and addiction. There have been similar epidemics in the past. The gin epidemic in England followed the development of distillation, a high dose delivery system for alcohol, similar to crack as a high dose delivery system for cocaine. This epidemic resulted in legislation that taxed distilled liquor and regulated public access to it. The cocaine and opium-morphine epidemics of the late 1800s in the United States led to the development of the Food and Drug Administration, the Harrison Act, and Prohibition, all of which limited public access to cocaine, opioids, and alcohol.

What is Addiction?

Chemical abuse and dependence are the medical synonyms for addiction. These are disorders of the brain that develop following exposure to alcohol and other drugs. Alcohol dependence, or alcoholism, is the most common addiction. The American Society of Addiction Medicine (ASAM) has studied the research literature and developed a new definition for alcohol dependence.

Alcoholism is a primary, chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations. The disease is often progressive and fatal. It is characterized by continuous or periodic:

1. impaired control over drinking
2. preoccupation with the drug alcohol
3. use of alcohol despite adverse consequences
4. distortions in thinking, most notably denial.[1]

This definition can be used for any other addiction, e.g. cocaine, by simply substituting cocaine for alcohol and removing the word "genetic" in the first sentence. It is possible that cocaine and other drug addictions have genetic components similar to alcohol addiction, but there has not been sufficient use over generations to establish that as a fact.

Cocaine, like all drugs that produce addiction, acts on the neurotransmitter systems in the brain. These neurotransmitters act on synapses, where neurons connect with each other, and on receptor sites, which influence the way each neuron works. Changes produced by cocaine or other addicting drugs appear to activate pleasure centers in the mid-brain, which is also the location for the source of our feelings and where memories are stored. The changes evidently persist after addiction has occurred. Therefore, when the drug is not present, the affected cells send messages to the cortex of the brain, where consciousness appears to be located, saying, "It would be great to have some cocaine (alcohol, nicotine, caffeine, etc.)." This may be the basis for craving. Since the messages come from below consciousness, they are often experienced as being in the body. When drug use is resumed, the cells welcome their old friend and adapt with incredible rapidity to old dosage levels, which could be fatal to the nonadapted person.

This disease concept of addiction is described by Alcoholics Anonymous (AA) as "cunning, baffling, and powerful." The power of addiction is underestimated and misunderstood by most people

who have had no direct experience with it.

What Causes Addiction?

Addiction appears to result when an addicting drug combines with a vulnerable brain, in an environment that makes continued use possible. The more powerful the addicting drug, the less vulnerable the brain has to be. With nicotine, cocaine, and heroin (the most powerful dependence producers) most brains are vulnerable. In the lab, animals will self-administer cocaine until they die. Nicotine's toxicity protects us from getting intoxicated with it, but the grip on nicotine addicts is sufficiently strong that three times as many deaths occur each year from tobacco use as from alcohol use.

In addition to the genetic factors that affect brain vulnerability, access to dependence-producing drugs influences the rate of addiction. Health care professionals (e.g., doctors, nurses, and pharmacists) have greater access to dependence-producing medications and much higher rates of addiction to opioids, depressants, and stimulants than does the general population.

Dosage is also an important factor. As the dose to the brain of alcohol, cocaine, and heroin increases, both the rates of addiction and of casualties increase. Len Bias, the University of Maryland basketball star who used cocaine, probably would not have died if he had been chewing coca leaves, which provide a low dose delivery system to the brain.

Environmental and cultural factors also influence the rates

of addiction to particular drugs. Native Americans and Irish Americans have higher than average rates of alcoholism. Black inner city dwellers have higher than average rates of crack cocaine addiction. Adolescents from broken homes who drop out of school have higher than average rates of alcohol and other drug addictions.

The course, or natural history, of addiction is similar for all drugs. First, there is a sense of pleasure. The mood swing is remembered and sought again by the person. The drug is viewed as a reliable, dependable friend. The pleasure is eventually followed by negative moods with anxiety, depression, insomnia, and craving. The user's thinking changes, often characterized by paranoid ideas. Relationships are affected, and the user's social support system weakens. Sexual dysfunction is common. Problems increase and life becomes a mess. Eventually, if physical health problems do not develop first, the user becomes sick and tired of being sick and tired. This condition may be a "bottom" experience and result in the user's entry into treatment.

The Role of Chemotherapy

Since drugs are associated with the development of addiction, they can also be used in the treatment of addiction. The most common uses are as follows:

1. Detoxification ("detox"). Usually a long-acting drug that is cross-tolerant with the drug of addiction is used. Librium (Chlordiazepoxide) for the treatment of alcohol

withdrawal is a good example. Most alcoholics can be detoxified in three to seven days, and delirium tremens (DT's) can be prevented.

2. Maintenance. A medically safe, i.e., pharmaceutically manufactured, drug is substituted for unsafe street drugs. The only drug in current use is oral methadone, a synthetic opiate mainly used to replace intravenous heroin. Although it gives comparatively little euphoria, methadone does block the effects of heroin for a fairly long time and thus reduces the addicts's desire to shoot heroin.

3. Antagonists. Antagonistic drugs oppose the action of narcotics or other specific substances on the nervous system. The two in current use are Antabuse (disulfiram) for alcohol and Trexan (naltrexone) for opioids. Beyond merely nullifying the effect of the abused substance, the antagonist can also link ingestion with punishment and thereby possibly condition the patient to avoid the formerly pleasurable drug. Antabuse, for example, brings on nausea, vomiting, and other unpleasant effects when alcohol is drunk. The problem with both these drugs is that they are not psychoactive, that is, they do not give pleasure and so people stop taking them.

4. Symptom Relievers. These drugs relieve anxiety, depression, pain, or other mental or physical discomfort. Examples of symptom relievers are opiates for pain (e.g., Demerol), stimulants for appetite control (e. g., Dexedrine), and benzodiazepines for tension and anxiety (e. g., Xanex). The most

effective symptom relievers are also addicting, so their use becomes maintenance, which is a continuing but controlled addiction. Symptom relievers that do not produce dependence, like Benadryl (diphenhydramine) and Motrin (ibuprofen), are less effective, but safer for people who have been addicted.

It is better to use nonchemical alternatives to alcohol and other drugs. Exercise, acupuncture, relaxation, meditation, biofeedback, self-hypnosis, prayer, and visualization are a few of the nonchemical techniques that can help addicts during and after detoxification.

Treatment

Major changes have taken place in treatment over the past two decades. In the 1970s a wide variety of approaches were used. Programs tended to deal with only one addiction problem, e.g., alcohol or heroin, and to ignore other drug use by their clientele. Today treatment is more intense and uniform. Most programs treat alcohol and other drug addicts together. The following elements are found in most addiction treatment programs:

1. Abstinence. Addicts learn best when their brains are free from dependence-producing chemicals. Detox is completed as rapidly as is safely possible since so much has to be learned.

2. 12-Step Programs. Twelve-step programs are based on the belief that alcoholism and drug addiction are spiritual diseases requiring spiritual healing. The steps themselves are a series of actions that range from acknowledging one's powerlessness over

an addiction, turning oneself over to God, making amends for past behavior, to finally carrying the message to others. During detox, meetings of 12-Step program organizations, e.g., Alcoholics Anonymous (AA), Narcotics Anonymous (NA), and Cocaine Anonymous (CA), are held on the premises. After patients have stabilized, they attend meetings in the community.

3. Group Therapy. The long process of rebuilding relational skills, learning to recognize and express feelings, and experiencing acceptance and forgiveness in a context of sharing and tolerance is begun in support groups. These groups are often run by certified substance abuse counselors, many of whom are recovering themselves.

4. Education. Addicted patients learn about the disease and a variety of ways of dealing with it. Films, lectures, and workshops emphasize skill development in maintaining sobriety and living a constructive, useful life. Emphasis is given to the fact that no addict is responsible for the disease, but each one is responsible for his or her behavior and for getting needed treatment. They are taught, "You alone can do it, but you can't do it alone."

5. Family Involvement. At one time excluded, family members are now seen as having the potential to add greatly to an addict's recovery.

6. Activities. A variety of nonchemical activities range from exercise to art. Keeping journals and other self-awareness enhancing skills are encouraged.

7. Relapse Prevention. Recognition of the high relapse rate in addictions has led to the development of techniques for prevention. Patients are taught to recognize the thinking, feeling, and behavioral states that precede using the addicting drug. They are also taught to recognize enabling behavior, how to develop a recovery support system, and to use a 12-Step member phone list. Should a slip occur, they are taught to feel anxiety rather than hopeless shame or guilt, to re-implement their program, and seek help quickly.

Treatment response takes time. Changes in the brain from addiction mean that dreams, memories, and conditioned withdrawal responses can occur long after alcohol or other drug use has stopped. It can take years to develop the skills to live a comfortable productive life. Prognosis varies and appears to be inversely proportional to the damage done to the brain and the social support system of the addict. Skid-row addicts who have lost everything have the lowest response rate to treatment (about 10 percent success). People diagnosed and treated while they still have jobs, as in employee assistance programs, have a 50 to 70 percent success rate in maintaining abstinence and keeping their jobs. Doctors have the most intense treatment programs with 28 days of inpatient treatment, 90 to 120 days of residential treatment in group homes, and two years of outpatient followup with 12-Step meetings, group therapy, and random urine testing. One of these programs reports more than a 90 percent success rate in maintaining abstinence and productive work.

Research Contributions

Research is the lifeline of medical practice.

1. The use of tricyclic antidepressants to reduce craving and relapse in cocaine addicts was studied. These drugs do not cause dependence themselves, and are thought to replenish dopamine levels that have been depleted by cocaine use. Dopamine is a substance essential to normal nerve activity in the brain.

2. Epidemiologic studies have shown:

a. That cycles of drug use occur. In the Haight-Ashbury district of San Francisco the use of psychedelic drugs was followed by amphetamine use, which was followed by heroin use. These cycles have taught us not to confine our attention to only one drug in treatment or prevention.

b. The importance of making treatment culturally congruent and relevant. For example, role models that alcoholic native Americans or black crack addicts can identify with are especially useful in the early phases of treatment. Health care workers must be culturally sensitive, but there is no evidence that they must be from the same ethnic group as their patients in order to provide effective treatment.

3. Nonchemical treatment approaches have received intense study.

a. Education about the disease concept emphasizes that the patient is not responsible for the addiction but is responsible for his or her behavior and for getting treatment.

b. Stress management includes a variety of techniques

ranging from "Don't Get HALT" (hungry, angry, lonely, or tired) to biofeedback training for states of relaxation.

c. Aerobic exercise changes brain metabolism and relieves craving, anxiety, depression, and anger. Thus, for example, on any given day in San Francisco's Golden Gate Park, several AA/NA/CA meetings could be held by the runners who are there.

d. Controlled use is not a viable goal in the treatment of addiction. We do not know if the social use of cocaine is possible over time. The evidence indicates that, as doses get higher, rates of addiction rise. Once a person has been addicted, the possibility of returning to social or controlled use is very slight. Re-exposure to tobacco, alcohol, cocaine, heroin, or other addictive substances incites craving, changes thinking, escalates usage (loss of control), and is accompanied by a rapid return of high tolerance levels.

e. The 12-Step programs of AA/NA/CA are the most effective treatment for maintaining stable sobriety. George Vaillant found that AA attendance accounted for 33 percent of the variance in stable recovery. This was far higher than any other aspect of treatment including various psychotherapies. Other studies have shown that admitting the fact of addiction to oneself and sharing it with others, the process involved in working the 12 steps, contributes to recovery of ten years or more.

f. Family members are affected by addiction. The

inclusion of family members in treatment and in 12-Step programs for families such as Alanon Naranon, and Cokanon has increased the success of treatment.

g. Coercion can be useful in getting addicts into treatment earlier, before irreparable damage is done. No one enters treatment voluntarily. It has been said that if you look closely at persons entering treatment, you will find the imprint of a foot on their posterior. Coercion from family, job, or the courts can help break through denial and provides some motivation to counter the pull of alcohol and other drugs.

Conclusion

The power of alcohol and other drug addiction is mystifying to those who have never experienced it. Research has supported the disease concept, suggesting that persistent, if not permanent, changes take place in receptor sites and neurotransmitter pathways in the brain. Important areas affected are probably in the mid-brain, in or near the centers responsible for memory, feelings, pleasure seeking, pain avoidance, and self-regulation. Treatment is improving. The longer and more intensive the treatment, the better the outcome, judging by our experience with addicted physicians. Treatment is certainly less expensive than long prison terms. Our current goal in dealing with the disease of drug or alcohol addiction is to recognize it earlier and intervene in a way that gets the person into effective treatment before permanent damage can be done either to the individual or to the community.

References

Alcoholics Anonymous. 1976. Alcoholics Anonymous: The Story of How Many Thousands of Men and Women Have Recovered from Alcoholism, 3rd ed. New York: AAWS, Inc.

Maxwell, M.A. 1984. The AA Experience: A Close-up View for Professionals. New York: McGraw-Hill Book Co.

Schuckit, M.A. 1989. Drug and Alcohol Abuse: A Clinical Guide to Diagnosis and Treatment, 3rd ed. New York: Plenum Medical Book Co.

Vaillant, G.E. 1983. The Natural History of Alcoholism: Causes, Patterns, and Paths to Recovery. Cambridge, Massachusetts: Harvard University Press.

Catalogues of other useful books on alcohol and other drug addictions can be obtained from the following sources:

AA World Services, Inc.
Box 459, Grand Central Station
New York, NY 10163

Comp Care Publishers
2415 Annapolis Lane
Minneapolis, MN 55441

Hazelden Educational Materials
Pleasant Valley Road
P.O. Box 176
Center City, MN 55012-0176

Health Communications, Inc.
Order Department
3201 Southwest 15th Street
Deerfield Beach, FL 33442-8124

Johnson Institute
7151 Metro Blvd.
Minneapolis, MN 55435-3425

Discussion Questions

1. What are some of the implications of viewing drug addiction as a disease? For example, does it mean that addicted individuals have a diminished responsibility for their behavior?

2. How do cocaine and other drugs produce addiction?

3. How are some drugs used to treat addiction? Should reliance on one drug, heroin, be replaced by reliance on another, methadone?

4. List the elements found in most addiction treatment programs. In your view, what is "spiritual healing" that is emphasized in 12-Step programs?

5. What are the lessons of research into various drug addictions? What is considered the most effective treatment?

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